CHANGE ISSUE

ASA MASPS
ASAS MOPS

Tracking Information (committee secretary only)	
Change Issue Number	12
Submission Date	January 13, 2004
Status (open/closed/deferred)	TBD
Last Action Date	---

Short Title for Change Issue:	Feedback on Air/Ground determination for non-automatic means

MASPS Document Reference: Section 3.1.2.4		Originator Information:	
Entire document (y/n)	n	Name	Tom Mosher, Garmin AT
Section number(s)	3.1.2.4	Phone	503-391-3522
Paragraph number(s)		E-mail	tom.mosher@garmin.com
Table/Figure number(s)		Other	

Proposed Rationale for Consideration (originator should check all that apply):	
	Item needed to support of near-term MASPS/MOPS development
X	DO-260/ED-102 1090 MHz Link MOPS Rev A
X	ADS-B MASPS :
	TIS-B MASPS
X	UAT MOPS :
	Item needed to support applications that have well defined concept of operation
	Has complete application description
	Has initial validation via operational test/evaluation
	Has supporting analysis, if candidate stressing application
	Item needed for harmonization with international requirements
X	Item identified during recent ADS-B development activities and operational evaluations
	MASPS clarifications and correction item
	Validation/modification of questioned MASPS requirement item
	Military use provision item
	New requirement item (must be associated with traffic surveillance to support ASAS)

Nature of Issue:		Editorial		Clarity	X	Performance		Functional

Issue Description:

As implemented in the UAT MOPS Rev A (DO-282A), the test procedures for verification of vertical status show that there are some unintended outcomes of the ASA MASPS requirements for air/ground determination when no automatic means is available. To wit:

1 - If Radio Altitude (RA) is not available, and either Ground Speed (GS) or Air Speed (AS) is available (but not both), then the aircraft will report as Airborne regardless of what the Ground Speed or Air Speed is. To illustrate, the following examples are taken from the UAT MOPS test procedures:

GS = 25 knot, AS not available, RA not available, result = AIRBORNE.
AS = 25 knot, GS not available, RA not available, result = AIRBORNE.

Note that the GS or AS could be as low as 1 knot, or indeed 0 knots, as long as the data is available, with the same result.

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Issue Description (*continued*):

The problem stems from the logic in the ASA MASPS requirement (paraphrased):

"Otherwise, if RA is not available, and if the participant's GS and AS are available, and GS < 50 knots and AS < 50 knots, then that participant shall set its Vertical Status to ON-GROUND."

If this condition is not met, the default setting for Vertical Status is AIRBORNE. The lack of any lower limits on the AS or GS value means that regardless of what the AS or GS value is, as long as only one of them is available, the aircraft must report that it is AIRBORNE.

2 - Another similar problem can be caused when the RA is available, but the GS and AS are both not available. In this case, the requirement applies the following logic (parapharased):

"If the participant's RA is available, and RA < 50 feet, and at least GS or AS is available and < 100 knots, the Vertical Status shall be set to ON-GROUND".

In this case if both GS and AS are not available, then regardless of the RA value, even 0 feet, the aircraft will report as AIRBORNE because that is the default condition when the above logic is not met. The lack of any minimum threshold for the Radio Altitude causes the AIRBORNE condition to be reported no matter what the RA value is.

Originator's proposed resolution:

1. Review the logic that is used to determine the Air/Ground state when no automatic means is available.
2. Consider inserting some minimum value of Radio Altitude which must be exceeded before the AIRBORNE state can be declared.